IOWA HIGHWAY RESEARCH BOARD (IHRB)
Minutes of September 30, 2011

Regular Board Members Present

A. Abu-Hawash
J. Berger
V. Dumdei
J. Joiner
J.D. King
E. Steffensmeier
W. Weiss
D. Schnoebelen
R. Younie
C. Scholz
D. Ahart

Alternate Board Members Present

Shashi Nambisan for James Alleman

Members with No Representation

R. Knoche
M. Nahra
J Moellering

Secretary - M. Dunn

Visitors

Vanessa Goetz	Iowa Department of Transportation
Sandra Larson	Iowa Department of Transportation
Lori Pflughaupt	Iowa Department of Transportation
Michael Nop	Iowa Department of Transportation
Ken Dunker	Iowa Department of Transportation
Bob Sperry	Iowa State University/InTrans
Chris Williams	Iowa State University/InTrans
Sri Sritharan	Iowa State University/InTrans
Kam Ng	Iowa State University
Steven Reneker	Kirkham Michael
Paul Weigand	SUDAS

The meeting was held at the Iowa Department of Transportation Ames Complex, Materials East/West Conference Room, on Friday, September 30, 2011. The meeting was called to order at 9 a.m. by Chairperson Doug Schnoebelen with an initial number of 11 voting members/alternates at the table.

Agenda
No changes were made to the Agenda.

Motion to approve Minutes from the July 29, 2011 meeting by R. Younie. 2nd by J. Berger.
Motion carried with 11 aye, 0 nay, 0 abstaining.

*** One Member Joined the Table***

FINAL REPORT TR-583, "Development of LRFD Procedures for Bridge Pile Foundations in Iowa", Sri Sritharan, Iowa State University/InTrans ($125,000)

BACKGROUND

The Federal Highway Administration (FHWA) has mandated that all new bridges initiated after October 1, 2007 will follow the LRFD design approach. Because of high variability in soil characteristics, complexity in soil-pile interaction, and difficulty in predicting a sensible pile resistance and driving stress, design in foundation elements pose more challenges than the superstructure elements. To improve the economy of

foundation design, American Association of State Highway and Transportation Officials (AASHTO) has recommended that higher resistance factors be used in the LRFD design method at a specific region where research has been conducted and/or past foundation data is available for validating the changes.

OBJECTIVES

This project had the following objectives: 1) Install and load test piles in the field; 2) Collect complete data including driving data; 3) Improve design of piles in accordance with Load and Resistance Factor Design (LRFD) specifications; 4) Develop a suitable dynamic analysis method for pile design; and 5) Disseminate research outcomes to bridge designers in Iowa and elsewhere.

BENEFITS

The completion of data analysis and interpretation will: 1) lay the foundation for developing a comprehensive database that can be populated at a reduced cost; 2) establish LRFD specifications for designing steel H-piles using static methods, dynamic analysis methods, and dynamic formulas; 3) develop a reliable construction control method using the dynamic analysis methods and dynamic formulas; and 4) quantify increase in pile capacities resulting from setup as a function of time.

Motion to Approve by W. Weiss. 2nd by A. Abu-Hawash.
Motion carried with 12 aye, 0 nay, 0 abstaining.

FINAL REPORT TR-606, "Iowa Public Employees Leadership Institute (LTAP)", Bob Sperry, Iowa State University/InTrans ($125,000)

BACKGROUND

Iowa LTAP has determined from past educational offerings that local agencies continue to struggle to send employees to training events. This is due to the challenges employers face in managing and properly allocating resources while trying to provide training opportunities. Factors that are considered when deciding whether to send employees to training include travel costs, as well as reduced production when employees are away from their work assignments. Travel and overnight expenses are sometimes barriers to attending workshops and conferences. Offering training opportunities online will allow employees the opportunity to participate in training events without having to travel.

An advisory committee was assembled to oversee the development and implementation of the curriculum. The committee identified 10 core courses from the national American Public Works Association (APWA)'s suggested Leadership outline to develop and present online and at professional association meetings and conferences.

The ISU Extension Continuing Education and Professional Development unit was interested in partnering with Iowa LTAP and agreed to assist in developing the Institute's identity and establishing a marketing plan. In addition, ISU Extension was responsible for recording, editing, and posting the courses online and will provide registration services under agreements.

OBJECTIVES

The objective for the approved project was to provide funding for the development of the entire leadership program. Activities completed as part of this project kept the development process moving forward and allowed time to plan the details for the balance of the courses.

BENEFITS

The Public Employees Leadership Institute can provide structured training for Iowa's public employees who wish to refine or develop management skills or for employers who wish to provide specific training to their future leader candidates. No other program is available in Iowa for them at this time.

Leadership Institute courses are provided online, on-demand, and can be taken at the convenience of the participant and employer, if desired. The fact that no travel time (or additional expenses) are incurred for this training is a major plus, given the reduced resources available for Iowa agencies' training programs. The alternative presentation platform provided by the Leadership Institute is an excellent solution for meeting many of the training needs of local agencies.

Motion to Approve by J. Joiner. 2nd by V. Dumdei.
Motion carried with 12 aye, 0 nay, 0 abstaining.

*** One Member Left the Table***

PROPOSAL, Western Iowa Missouri River Flooding; Geo-Infrastructure Damage Assessment, Repair and Mitigation Strategies, submitted by: David White, Iowa State University/InTrans ($50,000 is requested from IHRB. $50,000 in matching funds will be provided by State SPR funds).

OBJECTIVES

(a) Field Reconnaissance — Review the geotechnical problems and challenges in the affected counties and cities, and prioritize areas for detailed in-situ testing and evaluation.

(b) In-Situ Testing and Evaluation — Conduct in-situ testing to conduct a geotechnical assessment of the flood affected areas. The in-situ testing will focus on:

1. Evaluating roadway support capacities (both paved and unpaved roads)
2. Evaluating embankment conditions (slope failures)
3. Identifying settlement problems along roadway segments, and around bridge abutments and culverts.
4. *Conducting a feasibility study for using 3D above water laser scanning coupled with 3D underwater sonar side scan technologies to evaluate the extent of erosion.
5. *Evaluating conditions of drainage structures using a water proof pipe crawler camera.

**Note: Line items (4) and (5) are important to understand the deployments of various technologies during flood recover and are not funded by this proposal. We are seeking alternative funding sources to support the investigation the use of these technologies (see appendix).*

(c) Field Data Report, Repair and Mitigation Strategies, and Recommendations — Develop a field data report, provide repair and mitigation strategies depending on the assessment of the level and extent of the damage, and recommendations for geo-infrastructure monitoring.

(d) Guide for Geo-Infrastructure Flood Damage Assessment and Repair Solutions — Develop the emergency response criteria and guidelines for evaluating geo-infrastructure and recommending repair solutions following a flood event.

Motion to Approve by V. Dumdei. 2nd by J.D King.
Motion carried with 10 aye, 0 nay, 1 abstaining (Nambisan)

ANNUAL REPORT AND CONTINUING FUNDIGN PROPOSAL, HR-140, Collection & Analysis of Streamflow Data, Gregory Nalley, USGS ($238,650)

OBJECTIVES

(1) Operate, maintain, and publish streamflow data for 21 continuous-record streamgages located throughout the State

(2) Operate, maintain, and publish high-flow data for 89 partial-record (crest-stage) streamgages located throughout the State.

(3) Collect and publish water-surface profiles, and storm and flood description information, for significant flood events of interest to the IDOT. Publish data for the July and August 2010 floods on the Little Maquoketa, North Fork Little Maquoketa, Maquoketa, North Fork Maquoketa, and South Skunk Rivers for 66 bridge sites and 380

river miles, and for the June 2011 flood on the Little Maquoketa and North Fork Little Maquoketa Rivers for 5 bridge sites and 20 river miles.

Discrepancies in the overhead rate shown in the proposal budget were noted. USGS will review the budget and resubmit it to Research staff for review and approval prior to contract execution for FY 12.

Motion to Approve J. Joiner. 2nd by A. Abu-Hawash. Motion carried with 11 aye, 0 nay, 0 abstaining.

Review Proposals from 2011 First Round Solicitations:

RFP IHRB 11-01 Development of Bio-Based Polymers for Use in Asphalt, Chris Williams, Iowa State University/InTrans, ($149,958)

OBJECTIVES

*Identify the most promising polymerization chemistries for forming linear-chain polymers from vegetable oils.

*Identify the triglycerides most amenable to such polymerization and collaborate with plant scientists to identify/develop agricultural feedstocks best suited to express these.

*Develop the structure-property relationships crucial to the use of soybean-oil based thermoplastics in applications currently dominated by petrochemcially-derived polymers.

Motion to Approve by J. Berger. 2nd by V. Dumdei.
Motion carried with 10 aye, 0 nay, 1 abstaining (Nambisan).

RFP IHRB 11-02 Optimizing Pavement Base, Subbase, and Subgrade Layers for Cost and Performance on Local Roads, Tom Cackler, National Concrete Pavement Technology Center, Iowa State University, ($150,000)

OBJECTIVES

1. Determine the level of increased performance on local roads when PCC is placed on granular subbase or treated subgrade and quantify the performance and cost effectiveness.
2. Develop a user guide for various traffic, soils and pavement factors for optimized performance and financial benefits.

Motion to Approve by W. Weiss. 2nd by D. Ahart.
Motion carried with 10 aye, 0 nay, 1 abstaining (Nambisan).

RFP IHRB 11-03

OBJECTIVES

*Develop guidelines for project selection including but not limited to design considerations such as existing pavement type, thickness, and distress, patching needs, traffic, and minimum subgrade support required.
* Review preferred practice of rubblization and crack & seat techniques and the selection of proper fracture size and how it relates to performance. Develop quantitative quality acceptance criteria for these projects and recommendations for the use of leveling course material.
* Develop a mechanistic, performance-based life cycle cost analysis with the MEPDG to further aid in project selection using these crack mitigation techniques based on previously completed studies on reflective crack mitigation techniques.

1. ***Reflective Crack Mitigation Guide for Flexible Pavements***, Chris Williams, Iowa State University/InTrans, ($99,966)

2. ***Reflective Crack Mitigation Guide for Flexible Pavements***, Halil Ceylan, Iowa State University/InTrans, ($119,999)

   Motion to Approve RFP IHRB 11-03 #1 by Chris Williams by E. Steffensmeier. 2nd by C. Scholz. Motion carried with 10 aye, 0 nay, 1 abstaining (Nambisan).

   RFP IHRB 11-03 #2 by Halil Ceylan received 0 votes.

NEW BUSINESS

Review of RFPs

Evaluating Roadway Subsurface Drainage Practices
Motion to approve the scope as modified by W. Weiss. 2nd by V. Dumdei.
Motion carried with 11 aye, 0 nay, 0 abstaining.

Pilot Project for a Hybrid Road Flooding Forecasting System
Motion to approve the scope approved by J. Joiner. 2nd by A. Abu-Hawash.
Motion carried with 9 aye, 0 nay, 2 abstaining (D. Schnoebelen & S. Nambisan).

Motion to Approve to request a Sole Source proposal from the Iowa Flood Center at the University of Iowa approved by J. Joiner. 2nd by R. Younie. Motion carried with 9 aye, 0 nay, 2 abstaining (D. Schnoebelen & S. Nambisan).

ADJOURN
Motion to Adjourn by S. Nambisan. 2nd by R. Younie.
Motion carried with 11 aye, 0 nay, 0 abstaining.

The next meeting of the Iowa Highway Research Board will be held Thursday, December 8, 2011, in the East/West Materials Conference Room at the Iowa DOT. The meeting will begin promptly at 1 p.m.

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Mark J. Dunn, IHRB Secretary